

Atlantic Middle Jurassic Carbonate (AMJ B1) Play

Gonyaulacysta pachyderma and *Gonyaulacysta pectiniger* biozones

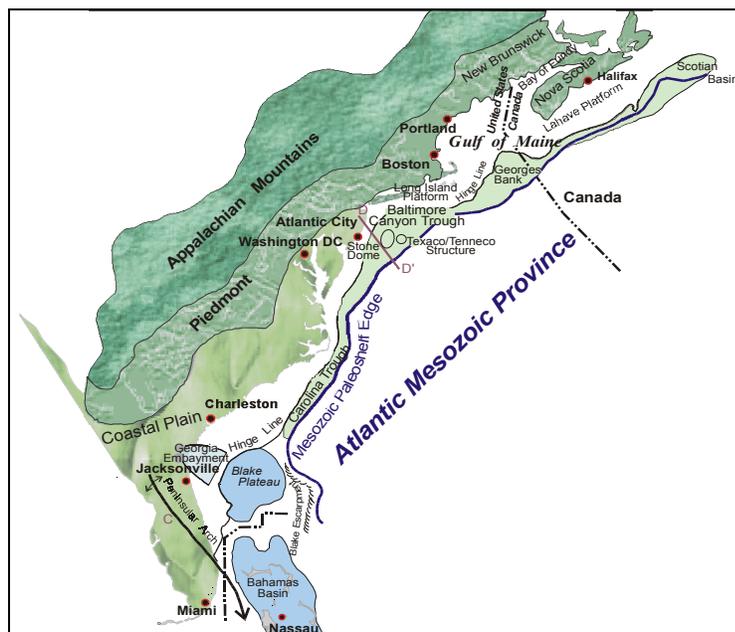


Figure 1. Physiographic map of the Atlantic Margin.

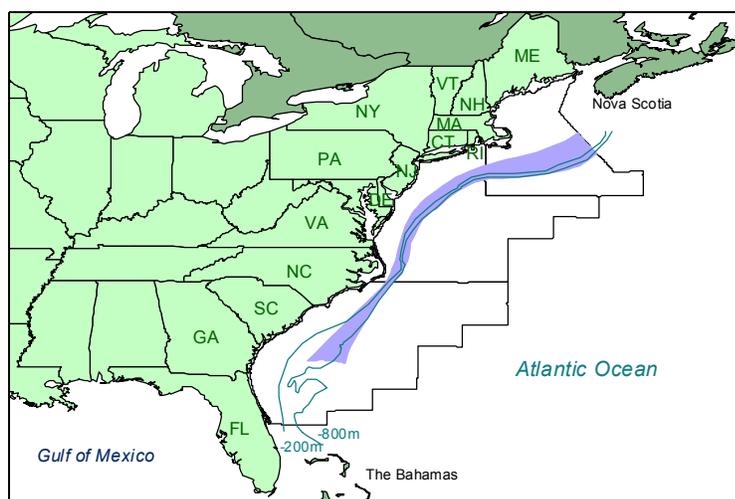


Figure 2. Play location.

Play Description

The frontier Atlantic Middle Jurassic Carbonate (AMJ B1) play occurs within the *Gonyaulacysta pachyderma* and *Gonyaulacysta pectiniger* biozones. This play extends from the U.S.-Canadian border through the Carolina Trough to the Blake Plateau (figures 1 and 2).

The AMJ B1 play is stratigraphically similar to the Atlantic Upper Jurassic Carbonate (AUJ B1) play. However, the middle Jurassic carbonate platform is much wider and extends farther shoreward because sediment influx was not as extensive during the Middle Jurassic.

Play Characteristics

The AMJ B1 play consists of shallow-water limestone platforms and ramps that merge with the slope. Potential reservoirs occur in porous bioclastic and pelletal carbonates that include pinnacle and patch reefs and associated reef talus. Structural closures over reefal buildups are possible, but potential traps are mainly stratigraphic. Potential source rocks include Jurassic shelf and slope shales. Geochemical analysis indicates organic matter to be primarily Type III with total organic carbon (TOC) ranging from 0.5 to 3 percent. The hydrocarbon evolution window extends from approximately 7,000 to 18,000 feet. Seals are provided by middle or lowermost upper Jurassic carbonates, shales, and anhydrites.

Discoveries

Exploration in the Atlantic Federal OCS area consists of 46 exploration and 5 COST wells. Of the 24 wells that may have penetrated this play, only one encountered hydrocarbons. Overpressured gas was encountered in Texaco's Hudson Canyon 642-1 well at almost 18,000 feet in probable middle Jurassic

2000 Assessment Mesozoic Stratigraphy						
	Gulf of Mexico Basin	South Florida Basin	Gulf of Mexico Plays*	Atlantic Basin/ Scotian Basin	Atlantic Plays	
Cretaceous	Upper	Selma Gp Taylor Gp Eutaw Fm Eagle Ford Gp Tuscaloosa Gp	Pine Key Fm	UK2 C1	Wyandot Fm Dawson Canyon Fm Mid SS Mbr Sable Island Mbr	AUK C1
	Lower	Dantzler Fm Washita Gp Fredericksburg Gp Paluxy Fm Glen Rose Fm Mooringport Fm Ferry Lake Fm Rodessa Fm James Fm Pine Island Fm Sligo (Pettet) Fm Hosston Fm Cotton Valley Gp	Dollar Bay Fm Sunniland Fm Brown Dolomite Zone Pumpkin Bay Fm Bone Island Fm	LK8 B1 LK6 B1 LK3 B1 LK3 B2 LK8-LK3 B1 LK8-LK3 B2 LK8-LK3 C3 LK3 B2	Logan Canyon Fm Upper Missisauga Fm — 0 Marker — M. Simplex shale Lower Missisauga Fm Mic Mac Fm	ALK C1
Jurassic	Upper	Cotton Valley Gp Haynesville Fm Buckner Fm Smackover Fm Norphet Fm	Wood River Fm Basal Clastics	UJ4 A1 UJ4 B1 UJ4 X1 UJ4 B2 UJ4 X2 UJ4 C1 UJ4 BC1	Mohawk Fm Motran Mbr Abenaki Fm Mohican Fm	AUJ C1 AUJ B1 AMJ C1 AMJ B1
	Middle	Louann Salt	Non-Deposition		Argo Salt	
	Lower		Basement		Eurdice Fm Basement	
Triassic	Upper	Eagle Mills Fm				
	Basement					

Rock unit positions do not imply age relationships between basins.
* Does not include plays that span ages.

Figure 3. Mesozoic stratigraphy of the Gulf of Mexico and Atlantic Margins.

AMJ B1 Carbonate Play Marginal Probability = 0.64	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	0	0.000	0.000	0.000
Cumulative production	—	0.000	0.000	0.000
Remaining proved	—	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	—	0.000	0.000	0.000
Undiscovered Conventionally Recoverable Resources				
95th percentile	—	0.000	0.000	0.000
Mean	27	0.130	0.611	0.239
5th percentile	—	0.413	1.633	0.688
Total Endowment				
95th percentile	—	0.000	0.000	0.000
Mean	27	0.130	0.611	0.239
5th percentile	—	0.413	1.633	0.688

Table 1. Assessment results for reserves, undiscovered conventionally recoverable resources, and total endowment.

rocks. The flow was not measured nor was the presence of reservoir-quality rock established.

Analog

Since the AMJ B1 play contains no Federal fields, productive upper Jurassic platform carbonate reservoirs of the onshore Gulf of Mexico and the lower Cretaceous Sligo-Stuart City reef trend of the onshore Gulf of Mexico provide the analogs for input parameters used in this assessment (figure 2).

The onshore upper Jurassic platform carbonate analog comprises the Smackover, Buckner, and Haynesville Formations, and Cotton Valley lime of Louisiana, Mississippi, and Alabama (figure 3). The analog type field is the Chunchula Field, Mobile County, Alabama. This field's production is from the upper Jurassic Smackover Formation (figure 3).

The analog area covers 7.6 million acres (11,850 square miles). Exploration has a success rate of approximately 10 percent, and drilling is at a mature stage with approximately 60 to 90 percent of the analog area being explored. Fields in the analog area contain an average of 35 percent oil, 22 percent gas, and 43 percent mixed hydrocarbons.

The lower Cretaceous Sligo-Stuart City reef trend analog comprises the Sligo Formation (figure 3) and Edwards Group (Fredericksburg Group equivalent) and covers an area of 104 million acres (162,435 square miles). Exploration has a success rate of approximately 10 percent, and drilling is at a mature stage with approximately 75 to 85 percent of the analog being explored. Fields in the analog area contain an average of 22 percent oil, 73 percent gas, and 5 percent mixed hydrocarbons.

Assessment Results

The marginal probability of hydrocarbons for the AMJ B1 play is 0.64. Assessment results indicate that undiscovered conventionally recoverable resources (UCRR) range

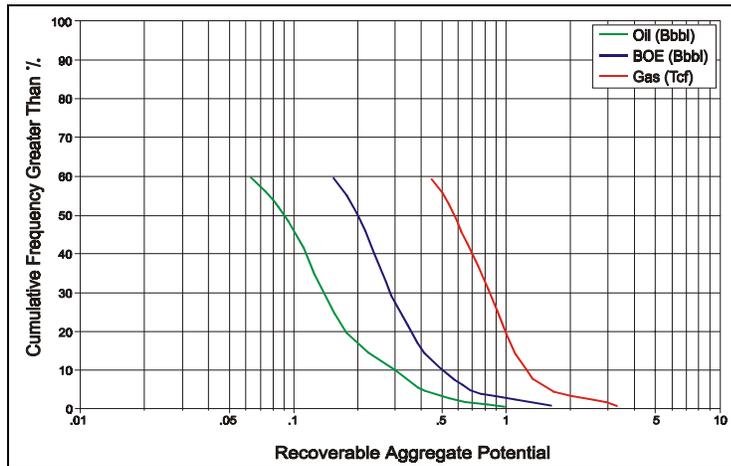


Figure 4. Cumulative probability distribution for undiscovered conventionally recoverable resources.

from zero at the 95th percentiles to 0.413 Bbo and 1.633 Tcfg at the 5th percentiles (table 1 and figure 4). Mean UCRR are estimated at 0.130 Bbo and 0.611 Tcfg (0.239 BBOE). These undiscovered resources might occur in as many as 27 pools. These pools have an unrisks mean size range of <1 to 179 MMBOE (figure 5) and an unrisks mean mean size of 14 MMBOE.

Potential for discoveries extends from the U.S.-Canadian border through the Carolina Trough to the Blake Plateau (figure 2).

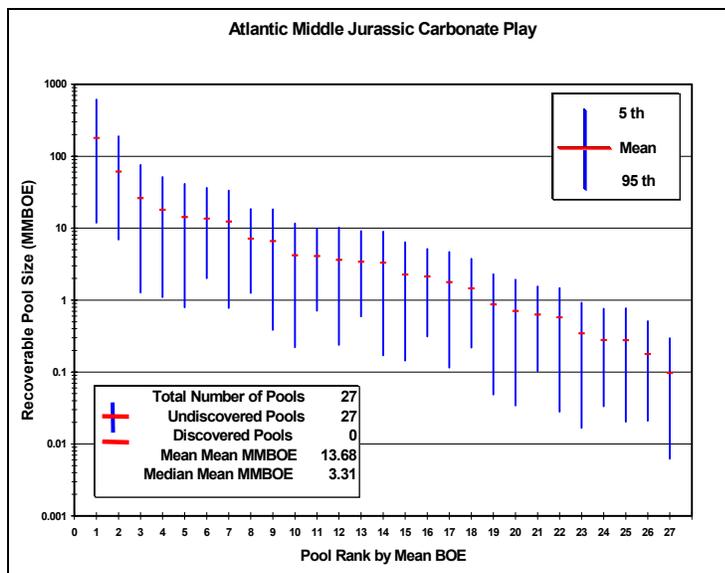


Figure 5. Pool rank plot showing the number of discovered pools (red lines) and the number of pools forecast as remaining to be discovered (blue bars).